

REMARKS

Claims 1-8 were pending in the case and stand finally rejected. This amendment is filed together with an RCE so as to obtain entry of this amendment.

The Examiner rejected Claims 1 and 2 under 35 USC § 103 as unpatentable over Yamada-I and Yamada-II, and further in view of Ishikawa et al. The Examiner said "The newly added limitation, "at least one lead frame of the lead frame having a portion that extends laterally to be coplanar with the front side of the die along a substantial portion of its length," is not specifically described or taught by Yamada-I or Yamada-II. However, Ishikawa, ...in Fig.6, etc. and col. 12, lines 59-65 describe at least one lead of the lead frame having a portion that extends laterally to be coplanar with the front side of the die along a substantial portion of its length to reduce the increased inductance in the semiconductor device."

Applicant has further amended Claim 1 herein to recite the feature shown in Fig. 1 wherein advantageously, the die is mounted front side down directly on the printed circuit board (PCB). This advantageously enhances electrical and thermal conductivity from the front side of the die to the PCB since thereby no wire bonds or similar indirect connections are required to the front side of the die. Hence the electrical terminals on the front side of the die are connected to the

PCB directly using solder or other conductive material with this surface mount-type technique.

None of the cited references use this approach. All appear to use mounting by leads, including Ishikawa et al. Moreover, in Fig. 6 of Ishikawa et al, it is shown how the leads extend out from the side surface of the package 12. With further reference to the cross-sectional view Ishikawa et al. Fig. 5c, the leads 11 extend outwards from the side surface of the package 12 and are embedded in the plastic with the plastic covering both their top and bottom surfaces. Hence this is neither a surface mount package nor a direct mounting of the die to the underlying PCB. It does not have the configuration of the leads and the insulating (e.g.,plastic packaging 20) encapsulant as shown in present Fig.1 where advantageously the leads do not extend from the side surface of the plastic packaging 20 but instead extend underneath the plastic package 20.

Hence it is respectfully submitted that Claim 1 as amended distinguishes over the cited references, even in combination, by reciting “wherein the second electrical terminal on the front side of the die is exposed for direct mounting connection on a support surface.” This reads on, for instance, present Fig. 1 and also clearly distinguishes over the cited references, none of which have this feature or even suggest same. Instead, the reference use conventional wire bonds from the die to the leads with only the leads being in electrical contact with the support surface. Hence, Claim 1 distinguishes over the cited references, as do Claims 2-8 due to their dependency on Claim 1.

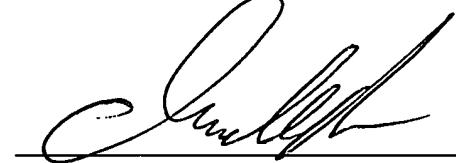
New Claim 9 has been added, also dependent upon Claim 1, and further distinguishes over the cited references by reciting "a plastic capsule in contact with the outside of the cup and wherein no part of the plastic capsule extends between the lead and the support surface when the die is mounted on the support surface." Again, this reads on Fig. 1 where the planar sections 18 of the leads extend underneath the plastic packaging 20 and not through the side surface thereof. Hence this advantageously allows the leads to be quite short, with most of their length being underneath the plastic packaging 20, rather than extending outwards from the side thereof. This reduces the surface area required for mounting the device since there is no needs for the long leads 11 as shown in Ishikawa et al. Figs. 5 and 6 extending laterally away from the side surface of the package; instead in accordance with the present invention most of the mounting portion of the lead is advantageously located underneath the plastic packaging, thereby minimizing the foot print of the packaged device. Hence Claim 9 distinguishes over the references and is allowable thereover for this additional reason.

Therefore it is requested that Examiner reconsider this case and pass it to issue with all Claims 1-9 allowed. If the Examiner contemplates other action, please contact the undersigned at (408) 938-9060.

Respectfully submitted,

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APPENDIX A – Changes to the Claims

1. (Five times amended) A semiconductor package comprising:
 - a semiconductor die having front and back sides, a first electrical terminal being located on the back side, at least a second electrical terminal being located on the front side; and
 - a leadframe in electrical contact with the first terminal, the leadframe being formed in the shape of a cup, the die being located in the cup, at least one lead of the leadframe having a portion that extends laterally to be coplanar with the front side of the die along a substantial portion of its length, and the at least one lead being in electrical contact with the first electrical terminal, the back side of the die facing in a direction toward the inside of the cup, wherein the second electrical terminal on the front side of the die is exposed for direct mounting connection on a support surface.